MISCELLANEOUS PAPERS

****

Centre for Entomological Studies Ankara

****

No 203 **06 January 2020** **ISSN 1015-8235**

On the Hepialidae of Turkey
(Lepidoptera)

Muhabbet Kemal[1] Sibel Kızıldağ Ahmet Ömer Koçak

Abstract: On the Hepialidae of Turkey (Lepidoptera). *Misc. Pap*. 203: 1-7, 8 figs. 2 maps
In this paper, the species of Hepialidae found in Turkey are discussed from various standpoints. Illustrations and maps for two species are also added.

Key words: *Triodia amasina, T. sylvina, Zenophassus schamyl,* Hepialidae, Lepidoptera, fauna, Turkey.

In this paper, the species of the family Hepialidae of Turkey are discussed. Hepialidae members inhabit mainly in the tropical, subtropical regions of the world. In Turkey, the number of the species is very small. Adults are on the wing at dusk. In principal they prefer damp localities. For the two species of Turkey, this is correct. Namely, *Triodia sylvina* and *Zenophassus schamyl* are arboreal species. They inhabit damp places in the forest zone of North Turkey. The third one, *Triodia amasina* prefer mountain steppe in Turkey. This type of habitat is rather dry.

Field studies of the lepidopterists were generally aimed at collecting materials. Therefore, biological observations are almost neglected. These three species of Hepialidae were obtained during general collecting activities of the authors in Turkey. We have to admit that no particular effort has been made for Hepialidae. Grehan's article on this subject contains very important information (Grehan, 1989). If meticulously studied, 2 more species may be added to the fauna of Turkey. These species may be *Hepialus humuli* and *Korscheltellus lupulina*. Although they have been mentioned from Turkey in some internet site or publication, we were unable to find their collecting localities from Turkey in the literature. For example, Turkey was shown inside the distribution area of *Korscheltellus lupulina* (Freina & Witt, 1990; Grehan & Knyazev,2019: 21, fig.4), without further information. In the Grehan's excellent Web Page on the World Hepialidae,[2] we could not find faunistic information about the occurence of *lupulina* in Turkey that we needed.

Some important subjects about Turkish Hepialidae are discussed below. Additionally, images of some adults, male genitalia and distributional maps are given. For the codes mentioned in the range, *vide*: Koçak & Kemal (2019).

[1] Dr Muhabbet Kemal & Dr Sibel Kızıldağ - Van Yüzüncü Yıl University, Faculty of Science, Dept. of Biology, Campus, Van / Turkey.
e-mails: muhabbet_kemal@yahoo.com.tr & sibelkizildag@yyu.edu.tr
Prof. em Dr Ahmet Ömer Koçak, c/o Yüzüncü Yıl University, Faculty of Science, Dept. of Biology., Van / Turkey.
e-mail: cesa_tr@yahoo.com.tr

[2] http://johngrehan.net/index.php/hepialidae [accessed on 5th Jan., 2020]

Hepialidae Stephens,1829

This primitive family of the Lepidoptera comprises 537 species in the world (Nielsen *et al.,* 2000). In Turkey, this family is well represented by three species only. Among the species, *Triodia amasinus* was originally described from the territory of this country. One or two species may be added to the Turkish fauna from the Caucasus Region, if north-eastern territory of Turkey can be researched extensively.
On the other hand, there is no barcoding attempt in the Bold Systems on the species of *Triodia* and *Zenophassus*. Our DNA barcoding process of the hepialid species of Turkey is ongoing.

Hepialinae Stephens,1829

In Turkey, only the genus *Triodia* is found in this subfamily. The occurences of *Korscheltellus lupulina* and *Hepialus humuli* in Turkey need confirmation.

Triodia Hübner,[1820]

Synonymy: *Triodia* Hübner,[1820]; *Alphus* Wallengren,1869 nec Thomson,1860
Original Reference: *Triodia* Hübner,[1820], Verz. bekannter Schmett.: 198. Type-species: *Phalaena (Noctua) sylvina* Linnaeus,1761, Fauna Suecica (Edn 2): 306, by subsequent designation by Viette,1949, Lambillionea 49: 103.
This genus contains two species in Turkey.

1. *Triodia amasina* (Herrich-Schäffer,[1851]) (Figs.1-7, Map 1)

Synonymy: *amasinus* Herrich-Schäffer,[1851]; *#signata* Spuler,1910; *dobrogensis* Caradja,1932; *pinkeri* Daniel,1967
Original Reference: *Hepialus amasinus* Herrich-Schäffer,[1851], Syst. Bearb. Schmett. Eur. Taf. Hepial. fig.7; ibid. 6: 30. Type(s): [Türkei]: "Von Herr Kindermann bei Amasia entdeckt".
Range (as code): **RO MK AL BG GR TR 05 06 10 12 13 22 23 26 33 42 45 46 58 63 65 70 71 05A 12A 12Ab 13F 13F25 13G 13G1 22C 22Ca 23C 33A 33Ae 42B 46D 46Dc 58N 65D 65Df 65F 65Fq 65K 65Ku 65Z 65Kd 65Kğ 65N 65Np7 65Nm 70C 70Ca 70Cg 71C**
Remarks: Pfitzner (1912: 435) reported the species from "Istria (Pola)" [Croatia], as "*Hepialus amasinus*". Later Osthelder (1931) described this population as a distinct species, "*Hepialus adriaticus*", which is currently considered as valid in the genus *Triodia*. Daniel (1932: 82) mentioned this as "*Hepialus amasinus*" from "Maraş" in October. Schwingenschuss (1938: 177) reported this species from Akşehir in September. This species was recently reported by the authors (Kemal *et al.*, 2019) from Bingöl [12], Bitlis [13], Edirne [22], Konya [42] and Kahramanmaraş [46] provinces. Some of these materials are illustrated here. Besides, antenna and head of this species are illustrated here for the first time **(Figs. 3-5).**
Triodia amasina inhabits mainly mountain steppe up to the subalpine zone in Turkey. Apparently absent in the forest zone of North Turkey. Univoltine. Flight period of the adult is in autumn, September-October. It has been recorded from Balkans to Turkey.
Further Material: 1♀. East Turkey, Elazığ Province [23], 10km E Koçkale 850m, 15.ix.2003, M.Kemal & A.Koçak leg. - 4♂. East Turkey, Van Prov., Çatak, Saklıvadi 2030m, 1.ix.2016, M.Kemal & A.Koçak leg. (Cesa).

2. *Triodia sylvina* (Linnaeus,1761)

Synonymy: *sylvina* Linnaeus,1761; *hamma* [Denis & Schiffermüller],1775; *flina* [Denis & Schiffermüller],1775; *angulatum* Fabricius,1781; *multicolor* Fourcroy,1785; *crux* Fabricius,1787; *angulum* De Villers,1789; c-*album* De Villers,1789; *fauna* Schrank,1801; *cruxator* Haworth,1802; *angulator* Haworth,1802; *sylvinator* Haworth,1802; *pallidus* Hormuzaki,1894; *poecilus* Hormuzaki,1894; *kruegeri* Turati,1909; *victoriae* Petkoff,1914; *androgynus* Agenjo,1942; *pardoi* Agenjo,1942; *alfaroi* Agenjo,1942; *laincalvo* Agenjo,1942
Original Reference: *Phalaena (Noctua) sylvina* Linnaeus,1761, Fauna Suecica (Edn.2): 306. Type: "Holmiae".
Range (as code): **ES FR Sa? Si IT GB BE NL LU DE CH AT Vor Trl Et Krt Stm Slz UAT LAT Wn Bgl PL CZ SK HU RO YU GR BG Sof Slv TR DK NO SE FI EE LV LT RU MD UA Cm GG Tbl Mng Kak Lag Cc 05 25 34 36 54 75 05A 34R 34Rb 36E 75F 75Fa**
Remarks: Romanoff (1879: 495) reported this species from Erzurum [25] "Erzéroum" [NE Turkey] in July.
The authors observed also this species from Posof [75Fa] (Ardahan Prov., NE Turkey), Sakarya Province [54], and Sarıyer [34Rb] (Istanbul Province) in autumn.
This species seems to be an arboreal one, probably bivoltine. Adults fly in summer and autumn.

Zenophassinae Tindale,1941

Original Reference: *Zenophassinae* Tindale,1941, Rec. S. Aust. Mus. 7: 17. Type-genus: *Zenophassus* Tindale,1941.
Remarks: This subfamily was established and *Zenophassus* classified under it by Tindale (1941). Nielsen *et al.* (2000) placed *Zenophassus* in the subfamily Hepialinae, without citing or discussing the status of Zenophassinae.

Zenophassus Tindale,1941

Synonymy: *Zenophassus* Tindale,1941
Original Reference: *Zenophassus* Tindale,1941, Rec. S. Aust. Mus. 7: 17. Type-species: *Hepialus schamyl* Christoph,1888, Horae Soc. ent. ross. 22: 309, by original designation.

3. *Zenophassus schamyl* (Christoph,1888)

Synonymy: *schamyl* Christoph,1888; *schamyli* Staudinger,1901
Original Reference: *Hepialus schamyl* Christoph,1888, Horae Soc. ent. ross. 22: 309. Syntypes ♂♀: [Georgia]: Borshom [Bjo]; westl. Kaukasus.
Range (as code): **Cc TR GG Bjo RU Mjk AZ Kir 53 61 53B 61K 61Kc 61N 61Na**
Remarks**:** This species was redescribed and illustrated by Christoph (1889: 198-200, pl.x figs. 1a-b.). For the first time, Deegener (1905) and Schaposchnikow (1905) published scent organ of the male and the behaviours during copulation and egg laying of this species, respectively. Nielsen *et al.* (2000) overlooked both papers in their publication. Slastshevskij (1929) published information about the biology of this species.
First capture of this arboreal species in Turkey was made by Koçak in late July 1972, at dusk in the forest at the elevation of 1100m above sea level (Koçak, 1975). Later, Koçak observed this species at the same place in August, and in Çamlıhemşin (Rize Province) [coded as "53B"]. Serdar Aslan observed and photographed this species in the vicinity of Ayvalı village (Trabzon Prov., NE Turkey) **(Fig. 8).** Kuznetzov & Stekolnikov (1986) published male genitalia and phallic musculature of this species.
Tindale (1941: 17-18) established a subfamily *Zenophassinae* and a genus *Zenophassus* for this species with detailed description and illustrations. Tindale mentioned also the collecting localities of this species in the Caucasus as "Kuban (July), Majkop (September) [Mjk]" [Russia], and Gence (="Elisabethpol" [Kir]) [Azerbaijan] **(Map 2)**.
Miljanovskii & Mitrofanov (1952) reported this species from Caucasus (Abkhasia) as a pest on grape vine.
As a result of these information, *Zenophassus schamyl* is an arboreal species, univoltine with the flight period of its adult from July to September. It has been recorded in Turkey, Georgia, Russia, and Azerbaijan so far.

Acknowledgements

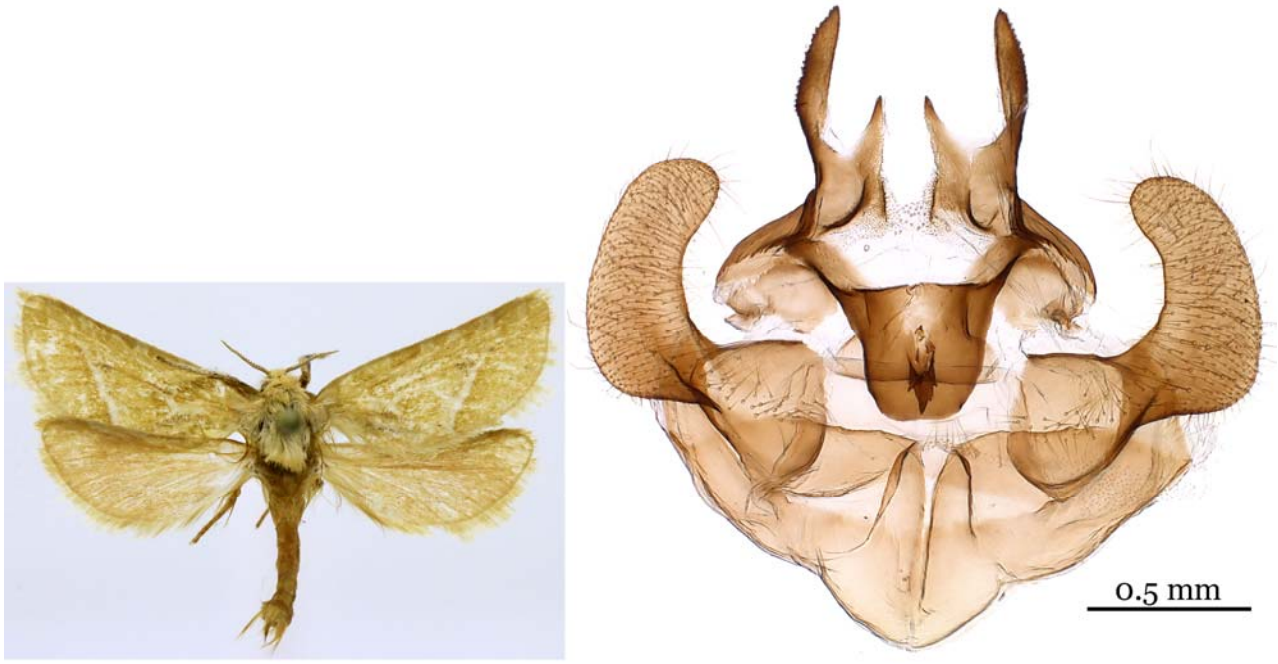
We thank to Mr. Serdar Aslan (Düzce University, Düzce, Turkey) for his kind permission for using his photograph.

References:

Christoph,H.,1888. Diagnosen zu einigen neuen Lepidopteren des palaearctischen Faunengebietes. *Horae Soc. ent. ross*. 22: 308-314.
Christoph,H., 1889. Neue Lepidopteren aus dem Kaukasus. [*in*] Romanoff, N.M., *Mém lépid*. 5: 193-202, pls.
Daniel,F., 1932. Thyrididae-Hepialidae. [In] Osthelder,L. & E.Pfeiffer, Lepidopteren-Fauna von Marasch in türkisch Nordsyrien. *Mitt. münch. ent. Ges.* 22 (2): 74-82.
Deegener,P., 1905. Das Duftorgan von *Phassus schamyl* Chr. I Anatomisch-histologischer Teil. *Z. f. wiss. Zool.* 78: 245-255, Taf. xiv.
Freina, J.J.de & T.J.Witt,1990. *Die Bombyces und Sphinges der Westpalaearktis (Insecta, Lepidoptera). Band 2. Cossoidea, Hepialoidea, Pyraloidea, Zygaenoidea*. Edition Forschung & Wissenschaft, München.
Grehan,J.R., 1989**.** Larval feeding habits of the Hepialidae (Lepidoptera). *J. nat. Hist*. 23: 803-824.
Grehan,J. & S.Knyazev, 2019**.** Potential influence of Mesozoic and Cenozoic tectonics on the evolution of European Hepialidae (Lepidoptera). *Biogeographia* 34: 17-32.
Kemal,M., Kızıldağ,S. & A.Ö.Koçak, 2019. Faunistic notes on some Heterocera of Turkey (Lepidoptera). *Misc. Pap*. 198: 1-14, 27 figs.
Koçak,A.Ö., 1975. New Lepidoptera from Turkey – I. *Atalanta* 6: 24-30, figs.
Koçak, A.Ö. & M. Kemal, 2019. First updated geographical codes used in the publications of the Cesa. *Priamus* 17 (4): 319-360.
Kuznetzov, V. I. & A.A. Stekolnikov, 1986. Morphology of the male genitalia of *Zenophassus schamyl* Chr. (Lepidoptera, Hepialidae) and evolution of the phallic musculature in Hepialomorpha. *Trudy Zool. Inst.,* Leningrad 145: 3-10.
Milyanovskii,E.S. & P.I.Mitrofanov, 1952. The large caucasian hepialid – a new pest of grape vines in Abkhasia. *Ent. Obozr*. 32: 82-85 [in Russian].
Nielsen,E.S., Robinson,G.D. & D.L.Wagner, 2000. Ghost-moths of the world: a global inventory and bibliography of the Exoporia (Mnesarchaeoidea and Hepialoidea) (Lepidoptera). *J. nat. Hist*.34: 823-878.
Osthelder,L., 1931. *Hepialus adriaticus* nova species. Eine verkannte europäische Hepialide. *Mitt. münch. ent. Ges*. 21: 47-51.
Pfitzner,R., 1912. 26.Family Hepialidae, pp.433-439. [*in*] Seitz,A. *The Macrolepidoptera of the Palaearctic fauna*. 2.volume: *The palaearctic Bombyces & Sphinges*. Stuttgart.
Romanoff,N.M., 1879. Quelques observations sur les Lépidoptères de la partie du Haut-Plateau Armenien, comprise entre Alexandropol, Kars et Erzéroum. *Horae Soc. ent. ross*. 14: 483-495, Taf.iii.
Romanoff, N. M., 1884. Les Lépidoptères de la Transcaucasie I. [in] Romanoff, N.M., *Mém. lépid*. 1: 1-92.
Schaposchnikow,C., 1905**.** Das Duftorgan von *Phassus schamyl* Chr. II. Ethologischer Teil. *Z. f. wiss. Zool.* 78: 255-260.
Schwingenschuss,L., 1938-1939, Sechster Beitrag zur Lepidopterenfauna Inner- Anatoliens. *Ent. Rdsch*. 55: 141-147, 157-164, 173-177, 181-184, 199-202, 223-226, 299-300, 337-340, 411-412, 454-457, 532, 700; 56: 133-135, 250-252.
Slastshevskij, P., 1929. Zur Biologie von *Phassus schamyl* Christ. (Lepidoptera, Hepialidae). *Russk. Ent. Obozr*. **23:** 189-200.
Staudinger,O., 1878-1881. Lepidopteren-Fauna Kleinasien's. *Horae Soc. ent. ross*. 14: 176-482; 15: 159-435; 16: 65-135.
Tindale,N.B., 1941. Revision of the ghost moths (Lepidoptera, Homoneura, family Hepialidae). Pt. IV. *Rec. S. Aust. Mus*. 7 (1) : 15-46, pls.

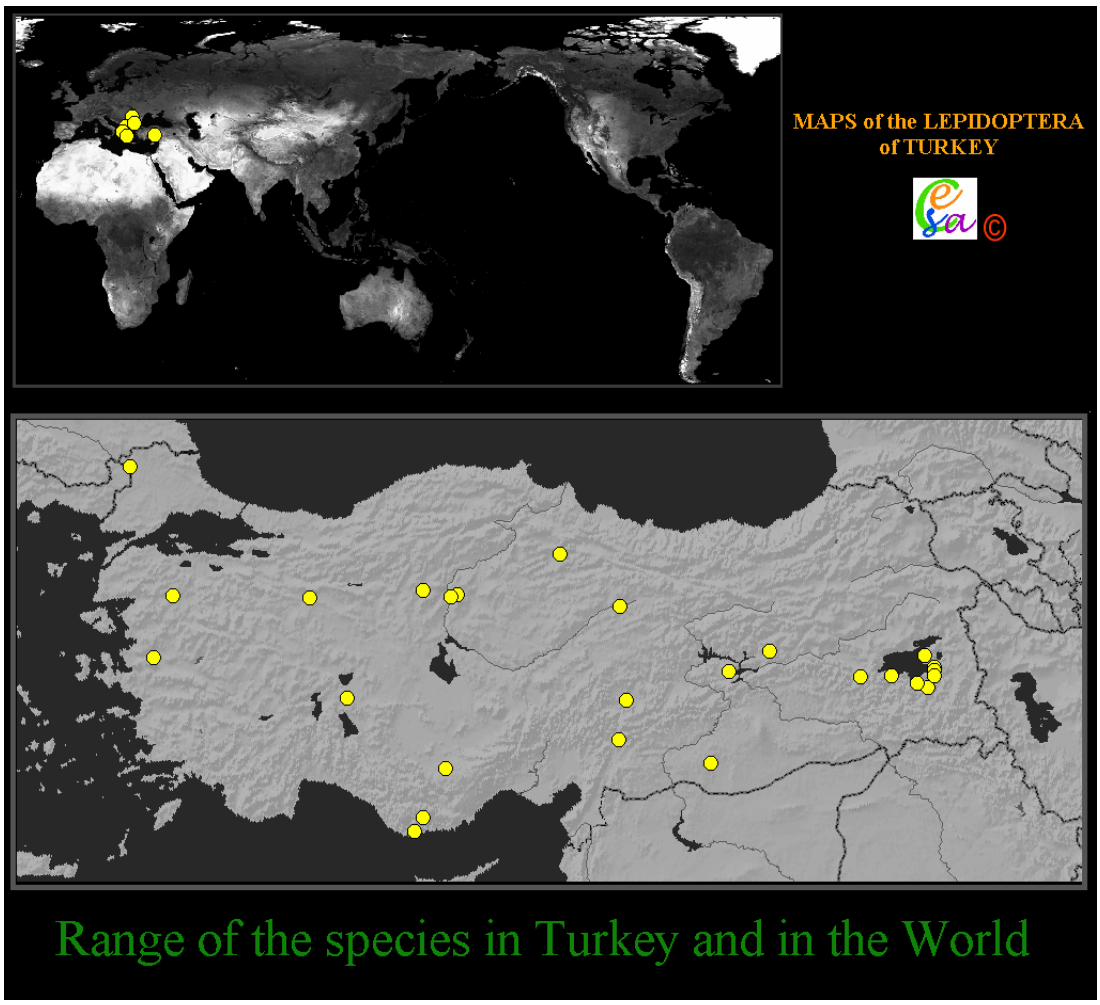
Figs. 1,2 - *Triodia amasinus* at rest. SE Turkey, Bitlis Prov., Tatvan, Kavaklı (left). E. Turkey, Bingöl Prov., Kuruca pass 1700m (right). M.Kemal (Cesa)

Figs. 3-5 - *Triodia amasina*. Antenna and head of the male with frontal and lateral view. East Turkey, Van Prov., Çatak, Saklıvadi. M. Kemal (Cesa)

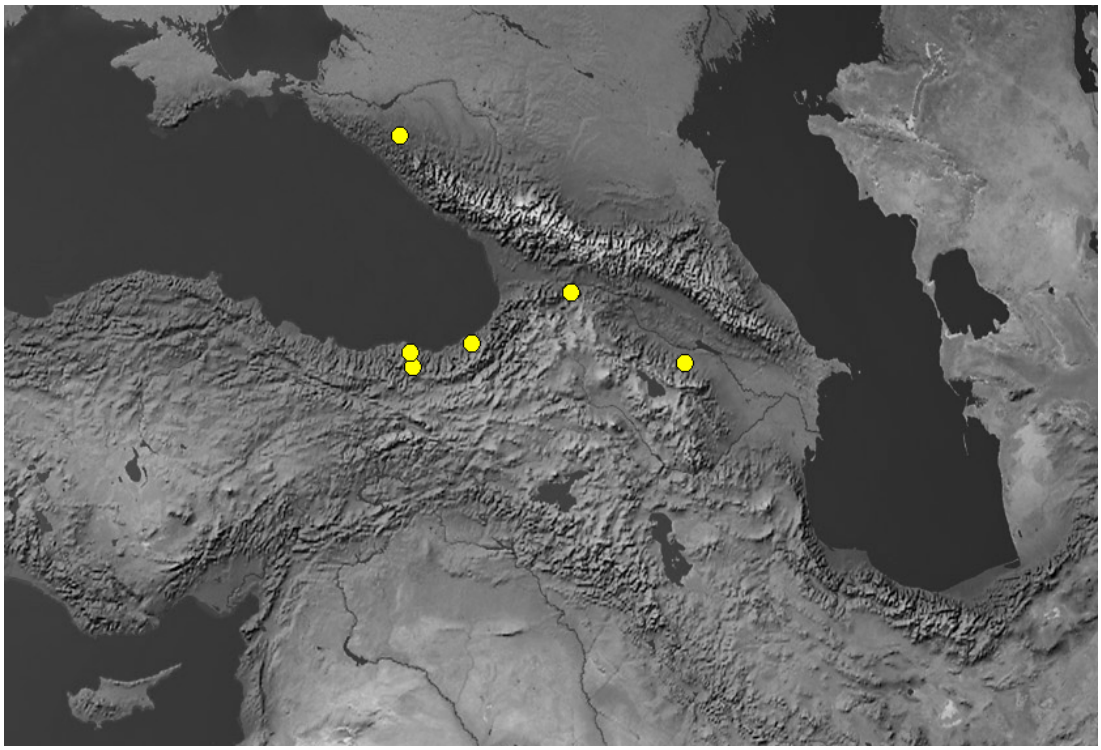


Figs. 6, 7 - *Triodia amasina*. Upperside of male and male genitalia (GP3187). S.Turkey, Kahramanmaraş Prov., Elbistan, Şar Dağı. M.Kemal (Cesa)

Fig. 8- *Zenophassus schamyl* at rest. NE Turkey, Trabzon Prov., Ayvalı village, 3 August, 2015, observed and photographed at night. Courtesy of Serdar Aslan.



Map 1 – *Triodia amasina.*



Map 2 – *Zenophassus schamyl*. Distribution in NE Turkey, North-West Caucasus (Majkop) [Russia], Borjom (Georgia) [type-locality], and Gence (=Elisabethpol) [Azerbaidjan].

MISCELLANEOUS PAPERS **ISSN 1015-8235**

Miscellaneous Papers is a peer reviewed serial of the Centre for Entomological Studies Ankara, established in **1989**. It appears at irregular interval in a year, as PDF format and includes original articles of the research workers of the Centre, regarding on various subjects on Entomology (taxonomy, nomenclature, checklist, fauna, biodiversity, distribution, biogeography, ecology, insect-plant interactions, bionomy, and behaviour).
The CESA is a non-profit group, no royalties will be paid to authors of contributions. Papers accepted become the copyright of the related serial.
Miscellaneous Papers is currently archived online at "Internet Archive", in accordance with the publication rules of the ICZN. It is an open-access serial, distributed under the terms of the "*Creative Commons Attribution License*", which permits free use, and distribution in any medium, provided the original author(s) and source are credited.

Centre for Entomological Studies Ankara

(A scientific Consortium)
(co-operation of research workers for pure-scientific, not commercial purpose)

Web Page of the Cesa: http://www.cesa-tr.org/
Scientific Serials: Priamus & Priamus Supplement (print and online versions) (ISSN 1015-8243)[3], Miscellaneous Papers (print and online versions) (ISSN 1015-8235) [4], Memoirs (print and online versions) (ISSN-8227)[5] DVD Films[6], Iconographia Insectorum[7] (online), Cesa Publications on African Lepidoptera (online)[8], Cesa News (online)[9], Cesa Books (online) [10]
Owners / Sahipleri - Editors / Yayıncılar: Prof. em Dr Ahmet Ömer Koçak (c/o Van Yüzüncü Yıl University, Van, Turkey), Asst. Prof. Dr Muhabbet Kemal Koçak (c/o Van Yüzüncü Yıl University, Van, Turkey).
Editorial Board of all Scientific Serials of the CESA / Bütün Bilimsel Yayınların Yayın Kurulu: Insecta, taxonomy, nomenclature, ecology, faunistics: Prof. em Dr Ahmet Ömer Koçak (c/o Van Yüzüncü Yıl Üniversitesi, Turkey), Asst. Prof. Dr Muhabbet Kemal Koçak (Van Yüzüncü Yıl University, Turkey).
Chief referees of all Scientific Serials of the CESA: Prof. em Dr Ahmet Ömer Koçak & Asst. Prof. Dr Muhabbet Kemal Koçak: Insecta, taxonomy, nomenclature, fauna, ecology, catalogues, checklists of the Old World.
Expert referees according to the subject areas: Dr Peter Huemer (Austria) and Dr. Ole Karsholt (Denmark): Gelechioidea, and some other Microlepidoptera groups in Palaearctic (Lepidoptera). Mag. Peter Buchner (Austria): Depressariidae (Lepidoptera). Dr J. B. Heppner (U.S.A.): Microlepidoptera of Nearctic and Neotropical. Dr G. Baldizzone (Italy): Coleophoridae (Lepidoptera). Dr V. Korneyev (Ukraine): Tephritidae, Pyrgotidae, Ulidiidae (Diptera). Prof. Dr Y.G.Verves (Ukraine): Sarcophagidae (Diptera). Dr Daniel Burckhardt (Switzerland): Psyllidae (Homoptera). Prof. Dr E. Heiss (Austria): Hemiptera. Dr R. Ehrmann (Germany): Mantodea. Prof. Dr Mustafa Ünal (Bolu, Turkey): Orthoptera. Prof. Dr Hüseyin Özdikmen (Turkey): Coleoptera. Prof. Dr Suat Kıyak (Turkey): Hemiptera.
Plant taxonomy, flora and vegetation: Assoc. Prof. Dr Murat Ünal, Asst. Prof. Dr Mesut Pınar, (Yüzüncü Yıl University, Van, Turkey).
Molecular studies: Asst. Prof. Dr Sibel Kızıldağ (Van Yüzüncü Yıl University, Van, Turkey).
Editorial policy: the submitted manuscript is evaluated by the Chief Editor and Referee. In case of need, the manuscript is sent to expert referees according to the subject areas.

ALL RIGHTS RESERVED

Correspondences should be addressed to: Prof. em Dr Ahmet Ömer Koçak, c/o Yüzüncü Yıl University, Fen Fakültesi, Biyoloji Bölümü, Kampus, Van / Turkey. - e-mail: cesa_tr@yahoo.com.tr

All the serials of the Cesa are archived regularly by the Internet Archive (300 Funston Ave., San Francisco, CA 94118, U.S.A.), in accordance with the rules of the International Codes of Zoological Nomenclature (ICZN)
https://archive.org/

also recorded regularly by the Zoological Record, Thomson Reuters, Enterprise House, Innovation Way, Heslington, York, YO10 5NQ, United Kingdom, https://clarivate.com/

[3] http://www.cesa-tr.org/Pri.htm
[4] http://www.cesa-tr.org/Miscell.htm
[5] http://www.cesa-tr.org/Memoirs.htm
[6] http://www.cesa-tr.org/CDF.htm
[7] http://www.cesa-tr.org/Icon.htm
[8] http://www.cesa-tr.org/CPAL.htm
[9] http://www.cesa-tr.org/Cesanews.htm
[10] http://www.cesa-tr.org/Cesabooks.htm